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(71) Applicant(s)

MAN Roland Druckmaschinen Aktiengesellschaft
(Incorporated in the Federal Republic of Germany)
Mühlheimer Strasse 341, D-63075 Offenbach,
Federal Republic of Germany

(72) Inventor(s)

Hans-Willy Schütz
Georg Hartung

(74) Agent and/or Address for Service

Gallafent & Co
9 Staple Inn, LONDON, WC1V 7QH, United Kingdom

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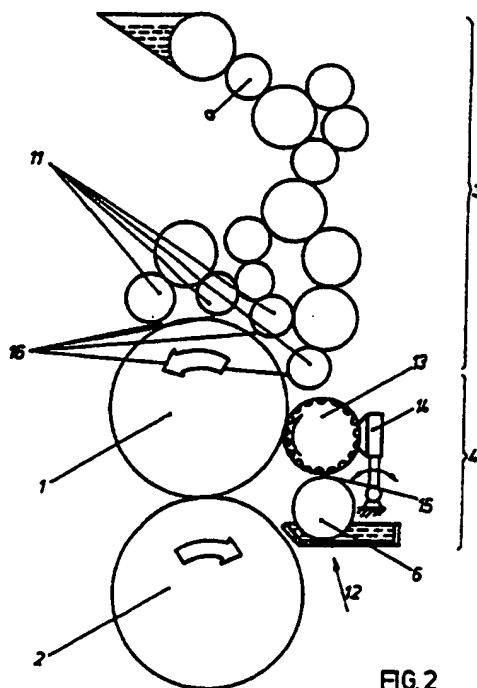
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(54) Abstract Title

Offset printing unit for varnishing printed materials

(57) The invention relates to an offset printing unit for varnishing printed materials in a rotary press, which can be used to carry out rapid reaction varnishing and accordingly is of increased useful value. In an offset printing unit, at least one damping applicator roller (5) coordinated to the plate cylinder 1 is exchangeable against a rastered applicator roller (13). The applicator roller (13) is functionally connected with a chamber doctor (14), and for varnishing the plate cylinder (1) is provided with a planographic printing forme with an elastic surface or a flexible letterpress printing forme.



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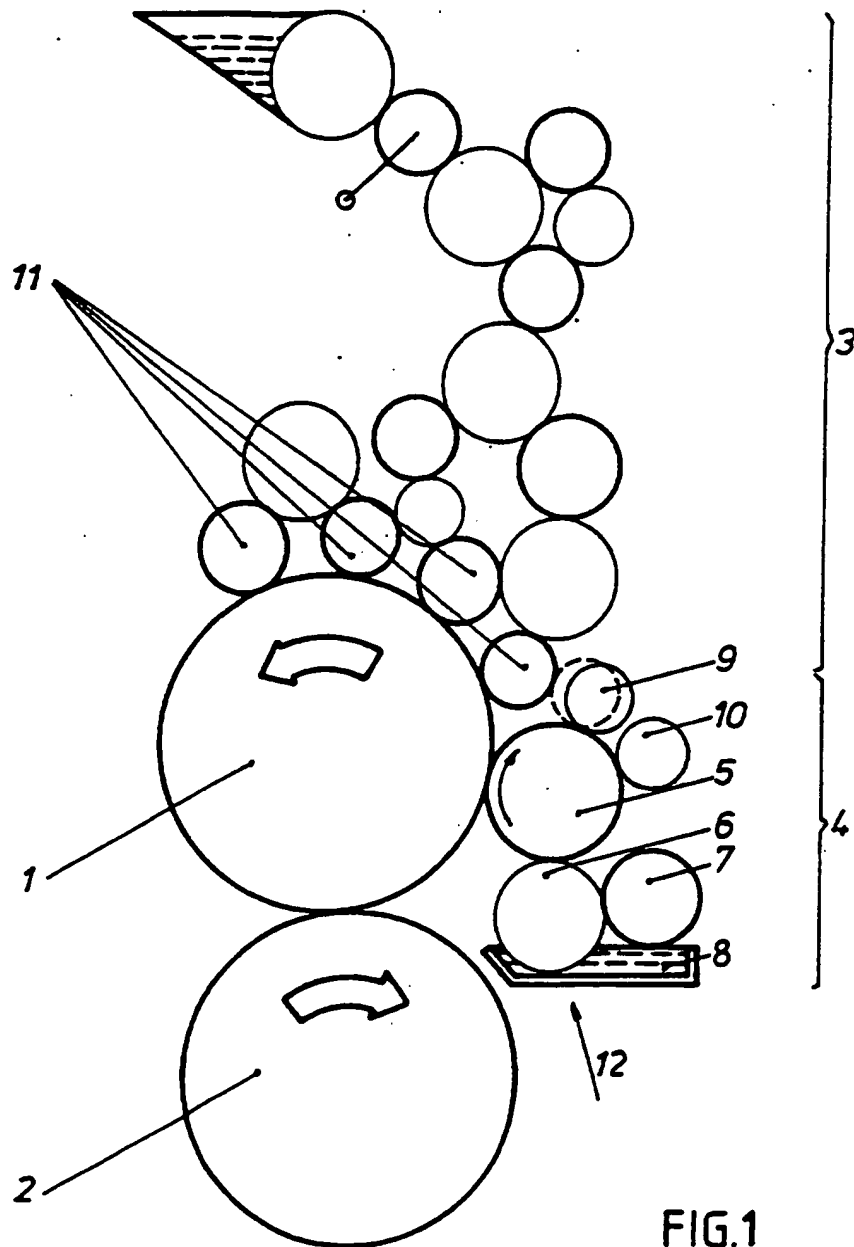


FIG.1

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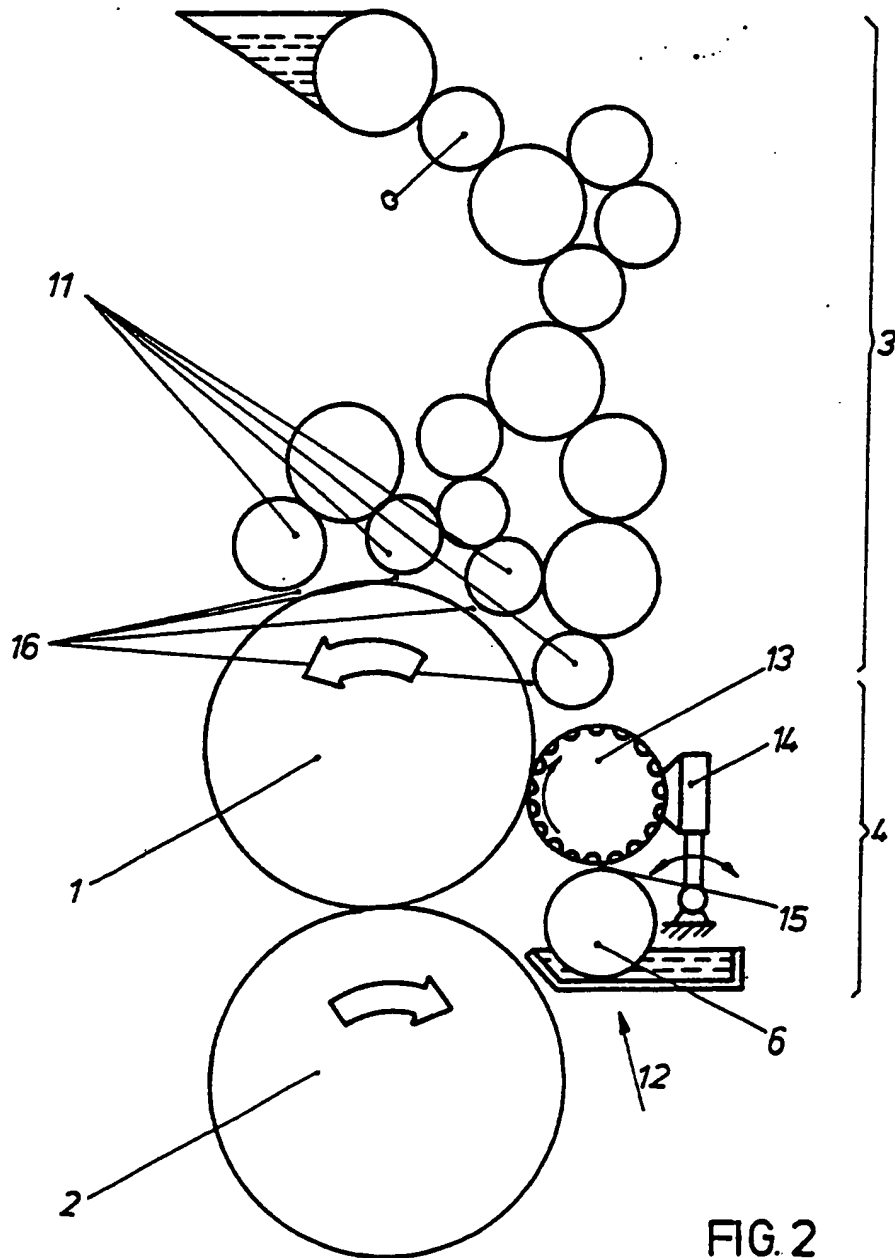


FIG. 2

- 1 -

OFFSET PRINTING UNIT FOR VARNISHING
PRINTED MATERIALS IN A ROTARY PRESS

5 This invention relates to an offset printing unit for
varnishing printed materials in a rotary press in
accordance with the preamble of the main claim.

10 A device of this type is known from DE 30 46 257 C2 as
well as also from DD 207 358 B1. According to these, the
damping unit on an offset printing press is used as
varnishing unit which works in accordance with the scoop
roller principle. According to DE 30 46 257 C2, the
applicator roller can be brought into contact with a
varnishing cylinder.

15 In contrast, in accordance with DD 207 358 B1, the
damping applicator rollers of an offset printing unit in
known fashion during printing operation are in contact
with the plate cylinder. On varnishing operation in
20 contrast to this in the damping unit, the damping agent
is exchanged against the varnish to be worked with. The
damping applicator rollers which can be brought into
contact with the plate cylinders take over the function
of the varnish applicator rollers. The varnish

application takes place in the first embodiment indirectly from the plate cylinder via the blanket cylinder to the printed material. In a further development, the plate cylinder is offset from the
5 blanket cylinder as well as the damping applicator rollers from the plate cylinder, so that the varnish application takes place direct via the blanket cylinder. For this, a damping applicator roller is functionally connected with an additional varnish applicator roller,
10 wherein this varnish applicator roller can be brought into contact with the blanket cylinder.

Disadvantageous, in this connection, is that the plurality of rollers extend the roller train as well as
15 increasing the number of splitting positions, which is difficult for varnish operation (the varnishing unit is sluggish, varnish can dry on rapidly) as well as in the cleaning of the rollers.

20 According to EP 0 767 058 A2, an applicator device is known which is swivellable against a plate cylinder and/or a blanket cylinder of an offset printing unit via pneumatic cylinders in a print on or print off position. The applicator device consists of an auxiliary frame
25 which can be set swivellably against the side frames of an offset printing unit. Applicator rollers which can be brought into contact with the blanket cylinder and/or the plate cylinder are mounted in the auxiliary frame, which are functionally connected with a metering system. The
30 metering system having applicator rollers works in accordance with the principle of scoop rollers or with a chamber doctor.

The present invention seeks to produce an offset printing

unit for varnishing printed materials in a rotary press which avoids the noted disadvantages, which, in particular, allows a rapid reaction varnishing and allows an increase in the useful value of the offset printing unit.

According to the present invention, there is provided an offset printing unit for varnishing printed material in a rotary press with an impression cylinder, a blanket cylinder and a plate cylinder with inking and damping units arranged thereto, wherein the damping unit has at least one damping applicator roller which is drivable and mounted rotationally settable on and off from the plate cylinder, and wherein the unit includes a rastered applicator roller which can be exchangeably arranged in bearings adapted to support the damping applicator roller, wherein the rastered applicator roller via adjusting means is functionally connected with a chamber doctor, wherein the chamber doctor is arranged exchangeably in the region of a further damping unit roller and wherein the unit includes a separate circulation system for the feed or return of varnish/cleaning fluid to or from the chamber doctor, means for separating the inking unit from the plate cylinder and means enabling the rastered applicator roller be driven positively connected with the plate cylinder or to be driven separately with the press stationary.

The offset printing unit in accordance with the invention is suited for the processing of differing varnish types such as e.g. aqueous dispersion varnish, UV varnish, blister varnish, or also of special inks such as e.g. metal printing inks, flexo printing inks. The offset

printing unit consists, in this connection, in a fashion known per se at least of one impression cylinder, a blanket cylinder and a plate cylinder, wherein the plate cylinder has fitted to it at least one inking unit. This construction is suited for waterless or damping agent free offset printing (dry offset). For wet offset printing, there is arranged prior to the inking unit seen in the direction of rotation of the plate cylinder a damping unit, wherein the damping unit has at least one damping applicator roller which can be brought into contact with the plate cylinder as well as a damping agent feed unit.

The offset printing unit for varnishing printed material in accordance with the invention is constructed in that a damping applicator roller is exchangeable against a rastered applicator roller and this applicator roller is functionally connected with a chamber doctor. In this connection, the plate cylinder carries a planographic printing forme with an elastic surface or a flexible letterpress printing forme and correspondingly is suited for full surface varnish application as well as also for separated varnish application (spot varnishing). The ink applicator rollers which would customarily stand in contact with the plate cylinder are separated from the plate cylinder during varnishing. The chamber doctor supports itself in a further bearing of the damping unit and/or can additionally be set in a swivelling bearing against the rastered applicator roller. The rollers feeding the damping agent are generally separate from the rastered applicator roller. Depending upon the construction of the damping unit, this can take place by taking out one of the rollers feeding damping agent neighbouring the applicator roller. Alternatively, this

roller can also be constructed eccentrically so that it can be set away or lowered. A further possibility for separation consists in that the exterior diameter of the rastered applicator roller (for the varnish application) is smaller than the exterior diameter of the damping applicator roller.

In the present invention, it is advantageous that only little re-building of an existing damping unit is necessary. The damping agent circulation cannot be contaminated since the chamber doctor has its own varnish/cleaning fluid circulation. The contact zone of blanket cylinder and plate cylinder is maintained for the varnishing operation analogous to the printing operation. Determined by the rastered applicator roller used as well as by the chamber doctor, the quantity of varnish can be evenly metered across the entire format width. On repeat orders, the quantity of varnish can be reproduced very well. The drive of the rastered applicator roller takes place in positively interlocked fashion from the plate cylinder drive and can be controlled by means of a central control unit. The offset printing unit in accordance with the invention with rastered applicator roller and chamber doctor allows, because of the small number of parts, rapid reaction varnishing and requires a small amount of space. Thereby, an increase in useful value is achieved since the offset unit can be driven as both for normal printing operation and for varnishing operation.

If the offset printing unit in accordance with the invention is no longer needed for varnishing, then the rastered applicator roller as well as the chamber doctor are taken out of their mountings and the damping

applicator roller as well as if necessary any further damping unit rollers are put back again into the original mountings.

- 5 It is of particular advantage if the rotary printing press has as well as the offset printing unit additionally still at least one varnishing unit. With this press arrangement, one can then varnish at least twice. When working with special inks also first the special ink can be applied to the printed material in the offset printing unit in accordance with the invention and then the varnish application takes place in the varnishing unit. Alternatively, also in an offset printing unit, first the varnish application can take place and then subsequently special ink can be applied even laid wet on wet on the damp varnish application. Thereby, effects of high brilliancy can be achieved on the printed material.
- 10
- 15
- 20 The invention is illustrated by way of example with reference to an exemplary embodiment shown in the accompanying drawings schematically, and in which Figure 1 shows the offset printing unit when being used for printing, with an inking unit and a damping unit, and
- 25 Figure 2 shows the offset printing unit in accordance with the invention, set up for varnishing.
- 30 In an offset rotary sheet printing press with several offset printing units for multi-colour printing, at least one offset printing unit is fitted out in accordance with the invention for varnishing. The offset printing unit consists, in this connection, essentially of a sheet

guiding impression cylinder (not shown in the drawings),
and a blanket cylinder 2 which is in contact with the
impression cylinder in a printing zone. Arranged
relative to the blanket cylinder 2, in contact with it in
5 the drawings, is a neighbouring plate cylinder 1.

In known fashion arranged relative to plate cylinder 1
for dry offset is an inking unit 3 and for wet offset
printing additionally a damping unit 4 arranged upstream
10 of the inking unit 3 seen in the direction of rotation of
the plate cylinder 1, which is operatively connected with
the plate cylinder 1. The inking unit 3 consists, in
this connection, of several ink applicator rollers 11
which are connected with ink feeding rollers (not
15 indicated in more detail). The damping unit 4 is -
observed in the direction of rotation of the plate
cylinder 1 - arranged prior to the inking unit 3 and
consists in the present example of a damping agent
container 8, a scooping damping ductor 6, a damping
20 metering roller 7 and a damping applicator roller 5.
Damping agent container 8 and damping ductor 6 constitute
the damping agent feed device 12 and the damping metering
roller 7 forms the already very thin damping agent film.
Arranged in contact with the damping applicator roller 5
25 is a damping agent receiving roller 9. The roller 9 is
arranged downstream after the contact position of damping
applicator roller 5/plate cylinder 1 in their direction
of rotation relative to the damping applicator roller 5.
It is arranged at the same time in the present example as
30 a bridging roller, in that the roller 9 can be brought
into contact with the first ink applicator roller 11 of
the inking unit 3 in the direction of rotation of the
plate cylinder 1. This switchable position of the roller
9, illustrated by dashed lines, is used for linking the

- damping unit 4 with the inking unit 3, e.g. for washing the rollers. Arranged further relative to the damping applicator roller 5 in its direction of rotation after the roller 9 there is furthermore a damping agent receiving roller 10 in contact relative to the damping applicator roller 5. The rollers 9 and 10 are linked with an axially operating oscillating drive. Rollers 9 and 10 have a surface coating e.g. of matt chrome.
- 10 The offset printing unit in accordance with the invention according to Fig. 2 consists, in this connection, at least of a rastered applicator roller 13 which is functionally connected with a chamber doctor 14. Applicator roller 13 as well as chamber doctor 14 are received at least in side bearings of the exchanged damping applicator roller 5, wherein the chamber doctor 14 is preferably arranged exchangeably in the region of a further original damping unit roller 6, 7, 9, 10. In the present example, this is the bearing of the exchanged damping metering roller 7. Preferred for use as the applicator roller 13 is a laser engraved ceramic roller. The rastered applicator roller 13 is, in this connection, linkable in positively interlocked connection with the drive of the plate cylinder 1 and on press stoppage can be driven separately e.g. by means of a free wheel coupling, in order to prevent drying on of the varnish. The chamber doctor 14 is connected with a feed lead as well as at least one return lead for the varnish, or also for cleaning fluid, which, in the preferred construction, form its own varnish/cleaning fluid circuit. If the rotary printing press is additionally equipped with its own varnishing unit, then the varnish/cleaning fluid circuit of the device in accordance with the invention can also be linked with the circuit of the varnishing

unit.

The varnish/cleaning fluid circuits can be linked with a central control.

5 The mode of operation is as follows: for varnishing operation, the inking unit 3 is separated from the plate cylinder 1. For this, the ink applicator rollers 11 are brought out of contact relative to the plate cylinder 1 at separation positions 16.

10

The damping applicator roller 5 as well as the rollers 9, 10 are removed from the damping unit 4 and replaced by the rastered applicator roller 13. The applicator roller 13 is then taken up in the bearings of the applicator roller 5, the bearing positions of the rollers 9, 10 remain free. In the present example, furthermore the metering roller 7 is taken out of its bearings and exchanged against the chamber doctor 14. The stationary damping ductor 6 is lowered into the damping agent container 8 so that, at a separation point 15, contact relative to the rastered applicator roller 13 is interrupted. The chamber doctor 14 can be set against the rastered applicator roller 13 by means of adjusting means, e.g. pneumatic working cylinders. The chamber doctor 14 has a positively set on closure doctor in the direction of rotation of the rastered applicator roller 13 and a negatively set on working doctor as well as side parts laterally sealing the housing. The chamber doctor 14 has on its housing an overall feeding varnish/cleaning fluid circulation which is arranged in the middle and linked with a feed pump. On the lower part of the housing of chamber doctor 14 are arranged two varnish/cleaning fluid leads coming out in the region of the side portions which are coupled with a suction pump.

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The varnish/cleaning fluid circuits are linked with one another and form a separate circuit with corresponding storage containers. The varnish is fed by the feed pump into the housing chamber of the chamber doctor 14, forms
5 in the chamber doctor 14 a reservoir with excess pressure as a result of which the varnish is transferred to the rastered applicator roller 13 or circulates in the circuit. Via the rastered little depressions in the applicator roller 13, the varnish is transferred to the
10 plate cylinder 1 and from this via the blanket cylinder 2 on to the printed material. The circulation system can likewise be used for the cleaning of chamber doctor 14 and the rastered applicator roller 13 with cleaning fluid. When varnishing via the plate cylinder 1, it is
15 advantageous if the flexible printing forme can be drawn on to the plate cylinder or changed by means of an automatic plate tensioning device. Such a device is described, for example, in DE 44 20 971 C1.

CLAIMS

1. An offset printing unit for varnishing printed material in a rotary press with an impression cylinder, a blanket cylinder and a plate cylinder with inking and damping units arranged thereto, wherein the damping unit has at least one damping applicator roller which is drivable and mounted rotationally settable on and off from the plate cylinder, and wherein the unit includes a rastered applicator roller which can be exchangeably arranged in bearings adapted to support the damping applicator roller, wherein the rastered applicator roller via adjusting means is functionally connected with a chamber doctor, wherein the chamber doctor is arranged exchangeably in the region of a further damping unit roller and wherein the unit includes a separate circulation system for the feed or return of varnish/cleaning fluid to or from the chamber doctor, means for separating the inking unit from the plate cylinder and means enabling the rastered applicator roller be driven positively connected with the plate cylinder or to be driven separately with the press stationary.
2. An offset printing unit according to Claim 1 wherein the plate cylinder carries a flexible letterpress plate.
3. An offset printing unit according to Claim 1 wherein the plate cylinder carries a planographic printing forme with elastic surface.
4. An offset printing unit according to any one of Claims 1 to 3 wherein the chamber doctor is additionally received in a swinging bearing.

5. An offset printing unit substantially as hereinbefore described with reference to the accompanying drawings.



The
Patent
Office

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Application No: GB 9815186.3
Claims searched: 1-5

Examiner: A J Rudge
Date of search: 25 September 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): B2L(LCGA);B6C(CBMB)

Int Cl (Ed.6): B05C-1/08;B41F-23/08;31/14;31/30;35/04

Other: Online WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	US 4,685,414 (DiRico)	1 at least

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.